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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/047,992

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Hitoshi Ohashi

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EXAMINER

TALBOT, BRIAN K

ART UNIT

PAPER NUMBER

1792

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/047,992	Applicant(s) OHASHI ET AL.	
	Examiner Brian K. Talbot	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,7,8,11,17,18 and 51-58 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,7,8,11,17,18,51-58 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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1. The amendment filed 10/14/09 has been considered and entered. Claims 2-6,9-10,12-16 and 19-50 have been canceled. Claims 57-58 have been added. Claims 1,7-8,11,17-18 and 51-58 remain in the application.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim Rejections - 35 USC § 103

4. Claims 1 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sterett et al. (5,746,844) in combination with JP 10-226,803.

Sterett et al. (5,746,844) teaches a method and apparatus for creating a three dimensional article using a layer-by-layer deposition of molten metal and annealing. The molten metal is applied by depositing the droplets in a predetermined pattern and rate (abstract). Sterett et al.

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(5,746,844) teaches the droplets can overlap one another to form a three dimensional product (Fig. 2 and col. 15 lines 1-19).

Sterett et al. (5,746,844) fails to teach measuring and comparing data that was set in the machine and not calculated by a monitoring device to control the deposited material.

JP 10-226,803 teaches a three dimensional body formed by various kinds of materials. Molten metal is spouted from a nozzle (10) to form droplets (20) that are applied to a substrate to form electric circuits (abstract). JP 10-226,803 teaches that the three dimensional data can be set in a storing means (60) or calculated and then compared to the monitored three dimensional data and adjusted to the desired values ([0010]-[0011])

Therefore it would have been obvious for one skilled in the art at the time the invention was made to have modified Sterett et al. (5,746,844) deposition process by incorporating a measuring/control system with data set in the machine (storing device) as evidenced by JP 10-226,803 to produce the desired circuit pattern.

Claims 1 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 10-226,803 alone or JP 10-226,803 in combination with Orme-Marmerelis et al. (6,520,402) both further in combination with Sterett et al. (5,746,844).

Orme-Marmerelis et al. (6,520,402) teaches a high speed direct writing with metallic microspheres. Small droplets of molten metal are generated toward a substrate to form conductive traces (abstract).

JP 10-226,803 teaches a three dimensional body formed by various kinds of materials. Molten metal is spouted from a nozzle (10) to form droplets (20) that are applied to a substrate to

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form electric circuits (abstract). JP 10-226,803 teaches that the three dimensional data can be set in a storing means (60) or calculated and then compared to the monitored three dimensional data and adjusted to the desired values ([0010]-[0011]).

JP 10-226,803 alone or JP 10-226,803 in combination with Orme-Marmerelis et al. (6,520,402) fail to disclosed the molten metal grains overlapping one another.

Features detailed above concerning the teaching of Sterett et al. (5,746,844) are incorporated here.

Therefore it would have been obvious for one skilled in the art at the time the invention was made to have modified JP 10-226,803 alone or JP 10-226,803 in combination with Orme-Marmerelis et al. (6,520,402) process by applying the molten metal material to be in overlapping fashion as evidenced by Sterett et al. (5,746,844) with the expectation of achieving the similar results, i.e. a conductive circuit.

Claims 7,8,17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over (a) JP 10-226,803 in combination with Sterett et al. (5,746,844) or (b) Orme-Marmerelis et al. (6,520,402) in combination with Sterett et al. (5,746,844) further in combination with JP 10-226,803 both (a) and (b) further in combination with Pan (6,501,663).

Features described above concerning (a) JP 10-226,803 in combination with Sterett et al. (5,746,844) or (b) Orme-Marmerelis et al. (6,520,402) in combination with Sterett et al. (5,746,844) further in combination with JP 10-226,803 are incorporated here.

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(a) JP 10-226,803 in combination with Sterett et al. (5,746,844) or (b) Orme-Marmerelis et al. (6,520,402) in combination with Sterett et al. (5,746,844) further in combination with JP 10-226,803 fail to specifically teach forming an insulating layer atop the molten layer.

Pan (6,501,663) teaches a three dimensional interconnect whereby an interconnect is covered with an insulator layer to protect the interconnect (abstract and Figs 5-7).

Therefore it would have been obvious for one skilled in the art at the time the invention was made to have modified (a) JP 10-226,803 in combination with Sterett et al. (5,746,844) or (b) Orme-Marmerelis et al. (6,520,402) in combination with Sterett et al. (5,746,844) further in combination with JP 10-226,803 by incorporating an insulator layer atop the molten metal circuit layer as evidenced by Pan (6,501,663) with the expectation of achieving a multilayered structure or a protective layer for the circuitry.

Claims 51-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over (a) JP 10-226,803 in combination with Sterett et al. (5,746,844) or (b) Orme-Marmerelis et al. (6,520,402) in combination with Sterett et al. (5,746,844) further in combination with JP 10-226,803 still further in combination with JP 11-040937.

Features described above concerning references (a) JP 10-226,803 in combination with Sterett et al. (5,746,844) or (b) Orme-Marmerelis et al. (6,520,402) in combination with Sterett et al. (5,746,844) further in combination with JP 10-226,803 are incorporated here.

(a) JP 10-226,803 in combination with Sterett et al. (5,746,844) or (b) Orme-Marmerelis et al. (6,520,402) in combination with Sterett et al. (5,746,844) further in combination with JP

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10-226,803 fail to specifically teach using compressed air for jetting the molten metal and using a mask to deposit the molten metal on a desired location of the substrate.

JP 11-040937 teaches injecting compressed gas in a pot of molten solder to jet the solder through a mask and onto a substrate (abstract).

Therefore it would have been obvious for one skilled in the art at the time the invention was made to have modified (a) JP 10-226,803 in combination with Sterett et al. (5,746,844) or (b) Orme-Marmerelis et al. (6,520,402) in combination with Sterett et al. (5,746,844) further in combination with JP 10-226,803 process by incorporating a compressed gas to aid in the jetting of molten metal as well as the use of a mask to provide a desired pattern as evidenced by JP 11-040937.

While the Examiner acknowledges the fact that JP 11-040937 teaches molten metal whereas the instant claims are directed toward a molten metal for circuitry, it is the Examiner's position that the process disclosed is not limited to the material utilized. In fact, one skilled in the art at the time the invention was made would have had a reasonable expectation of achieving similar results with any molten "material".

Response to Amendment

5. Applicant's arguments filed 10/14/09 have been fully considered but they are not persuasive.

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Applicant argued that the prior art fails to teach a second coordinate system that does not coincide with the first coordinate system defining a set of three dimensional data.

The Examiner agrees in part. The prior art teaches that the three dimensional data can be set in a storing means (60) or calculated and then compared to the monitored three dimensional data and adjusted to the desired values ([0010]-[0011]). While the prior art may not teach a second coordinate system, it is the Examiner's position that one skilled in the art at the time the invention was made would have had a reasonable expectation of similar success using the monitored/calculated/adjusted values for more than one coordinate system. It has been well settled that the mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 124 USPQ 378 (CCPA 1960). This is the case here where the "duplication" of a process if performed with a second coordinate system regardless of whether that second coordinate system is integrated with the first coordinate system.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian K. Talbot whose telephone number is (571) 272-1428. The examiner can normally be reached on Monday-Friday 6AM-3PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Brian K Talbot/
Primary Examiner, Art Unit 1792

BKT

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